# Geographic Composition of the Canadian Labour Force

BY SYLVIA OSTRY

# *The Geographic Composition of the Canadian Labour Force*

by
Sylvia Ostry

ONE OF A SERIES OF LABOUR FORCE STUDIES
in the
1961 CENSUS MONOGRAPH PROGRAMME

DOMINION BUREAU OF STATISTICS
OTTAWA, CANADA,
1968

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# *Foreword*

The Canadian Censuses constitute a rich source of information about individuals and their families, extending over many years. The census data are used widely but it has proved to be worthwhile in Canada, as in some other countries, to supplement census statistical reports with analytical monographs on a number of selected topics. The 1931 Census was the basis of several valuable monographs but, for various reasons, it was impossible to follow this precedent with a similar programme until 1961. Moreover, the 1961 Census had two novel features. In the first place, it provided much new and more detailed data, particularly in such fields as income, internal migration and fertility, and secondly, the use of an electronic computer made possible a great variety of tabulations on which more penetrating analytical studies could be based.

The purpose of the 1961 Census Monograph Programme is to provide a broad analysis of social and economic phenomena in Canada. Although the monographs concentrate on the results of the 1961 Census, they are supplemented by data from previous censuses and by statistical material from other sources. The present Study is one in a Series on the Canadian labour force. In addition to these Labour Force Studies, monographs have been or will be published on marketing, agriculture, fertility, urban development, income, immigration, and internal migration.

I should like to express my appreciation to the universities that have made it possible for members of their staff to contribute to this Programme, to authors within the Dominion Bureau of Statistics who have put forth extra effort in preparing their studies, and to a number of other members of DBS staff who have given assistance. The Census Monograph Programme is considered desirable not only because the analysis by the authors throws light on particular topics but also because it provides insight into the adequacy of existing data and guidance in planning the content and tabulation programmes of future censuses. Valuable help in designing the Programme was received from a committee of Government officials and university professors. In addition, thanks are extended to the various readers, experts in their fields, whose comments were of considerable assistance to the authors.

Although the monographs have been prepared at the request of and published by the Dominion Bureau of Statistics, responsibility for the analyses and conclusions is that of the individual authors.

Walter E. Duffett.

DOMINION STATISTICIAN.

# *Preface*

This is one of a series of studies dealing with selected aspects of the labour force in Canada as revealed, in the main, by the 1961 and earlier Censuses. The present study deals with the changing provincial distribution of the labour force and its major components and the extent and nature of structural changes in the occupational and industrial deployment of manpower within the provinces in. relation to the national pattern of activity.

I am indebted for helpful comment and criticism to Mr. S.E. Chernick and Mr. T. Shoyama of the Economic Council of Canada who read an earlier draft of the study. Thanks are due also to members of the Census Division of the Dominion Bureau of Statistics for their co-operation and assistance in providing historical data. The usual observation, with respect to the author's responsibility for error, of course applies.

Sylvia Ostry,
*Director,*
*Special Manpower Studies and Consultation,*
*Dominion Bureau of Statistics.*

OTTAWA, 1968

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# *Introduction*

Other Studies in this Series have examined the changing demographic and economic composition of the Canadian labour force as a whole. The object of this present Study is to bring out some of the more important geographic aspects of these developments, *viz.*, to describe the main features of the geographic composition of the working population and its major components. The geographic unit, of necessity, must be the province; data and other limitations preclude consideration of any other.[1] The province in Canada is, to say the least, far from being an ideal unit for economic analysis. None the less, a good deal of policy discussion and decision-making is provincially oriented in this country and the analysis of manpower in a provincial context is, in this respect, not without relevance and importance.

This Study will consider three aspects of the geographic composition of the labour force. First, it is of some interest to learn how evenly or unevenly the labour force, employment, unemployment and the major occupational and industrial groups are distributed across the country. A useful graphic device for presenting this information is the Lorenz curve and, where appropriate, it will be used in Section 1. While the Lorenz curve usefully depicts the provincial distribution of the labour force and its components, it will not reveal anything about the composition of the labour force in any particular province. The second section, then, will adopt the technique of comparing the occupational and industrial composition of the provincial work force with that of Canada as a whole, to see how closely each province resembles or differs from the national pattern and, by comparing data at different census dates, whether or not there has been any tendency to convergence or divergence in this respect. Finally, it is a commonplace of economic observation in Canada that the ten provinces have not shared equally in the growth of the national labour force and employment. A full-scale historical analysis of regional growth patterns is clearly

[1] The county or census division, for which data are available, is too small a geographic unit for most types of "regional" analysis. Some intermediate unit, between the county and the province, would be useful. For a discussion of problems and methods of defining economic regions see *Conference on Statistics, 1964, Papers on Regional Statistical Studies*, edited by Sylvia Ostry and T.K. Rymes, Toronto, 1966, especially papers by D.M. Ray and Brian J.L. Berry and discussion by Z.W. Sametz.

out of the question in this Study. However, an examination of the distribution of industrial employment[1] in the provinces, in terms of differential growth rates over the past intercensal decade, will provide some insight into the current provincial distribution of economic activity. This will be the subject matter of the third section of the present Study.

[1] The industrial rather than occupational distribution was considered becauae the focus of attention ia on economic activity and changea in demand and technology have, for the most part, their initial or primary impact on industry rather than occupation. Further, employment rather than labour force was preferred as an indicator of economic activity in this context. Thia choice limited the analysis to the 1951-61 period because of lack of comparable industry data from earlier censuses. Further, in a comprehensive analysis, other indicators of the volume of economic activity — such as total income or output — as well as welfare indicators, such as per capita income, would also be examined but they have a secondary order of importance in a study chiefly oriented to the distribution of manpower. It must not be assumed, however, that the interprovincial shifts in other indicators of economic actlvity were necessarily aimilar in pattern to those exhibited by employment. [See, however, S.E. Chemick, *Inter-regional Disparities in Income*, Economic Council of Canada, Staff Study No. 14 (Ottawa: 1966) for discussion of income.]

# 1. The Provincial Distribution of the Labour Force and its Major Components

The Lorenz curve traces the relationship between the frequencies of two variables cumulated in order of magnitude of the ratio between them.[1] If the relationship were constant the curve would be represented by the 45° line or diagonal and, indeed, description and comparison of Lorenz curves is usually couched in reference to the diagonal. Thus, the more the curve deviates from the diagonal, the more unequal is the distribution which it depicts. For the most part, observation alone is sufficient for explanatory and comparative purposes. However, when it is difficult to discern a very slight shift in a curve from one period to another or to assess the difference between two similar distributions, or if the degree of inequality in the distribution is so slight that the Lorenz curve approximates the diagonal and is, therefore, difficult to draw, a useful and simple summary measure of inequality which may be used is the Gini index of concentration.[2]

## POPULATION AND LABOUR FORCE

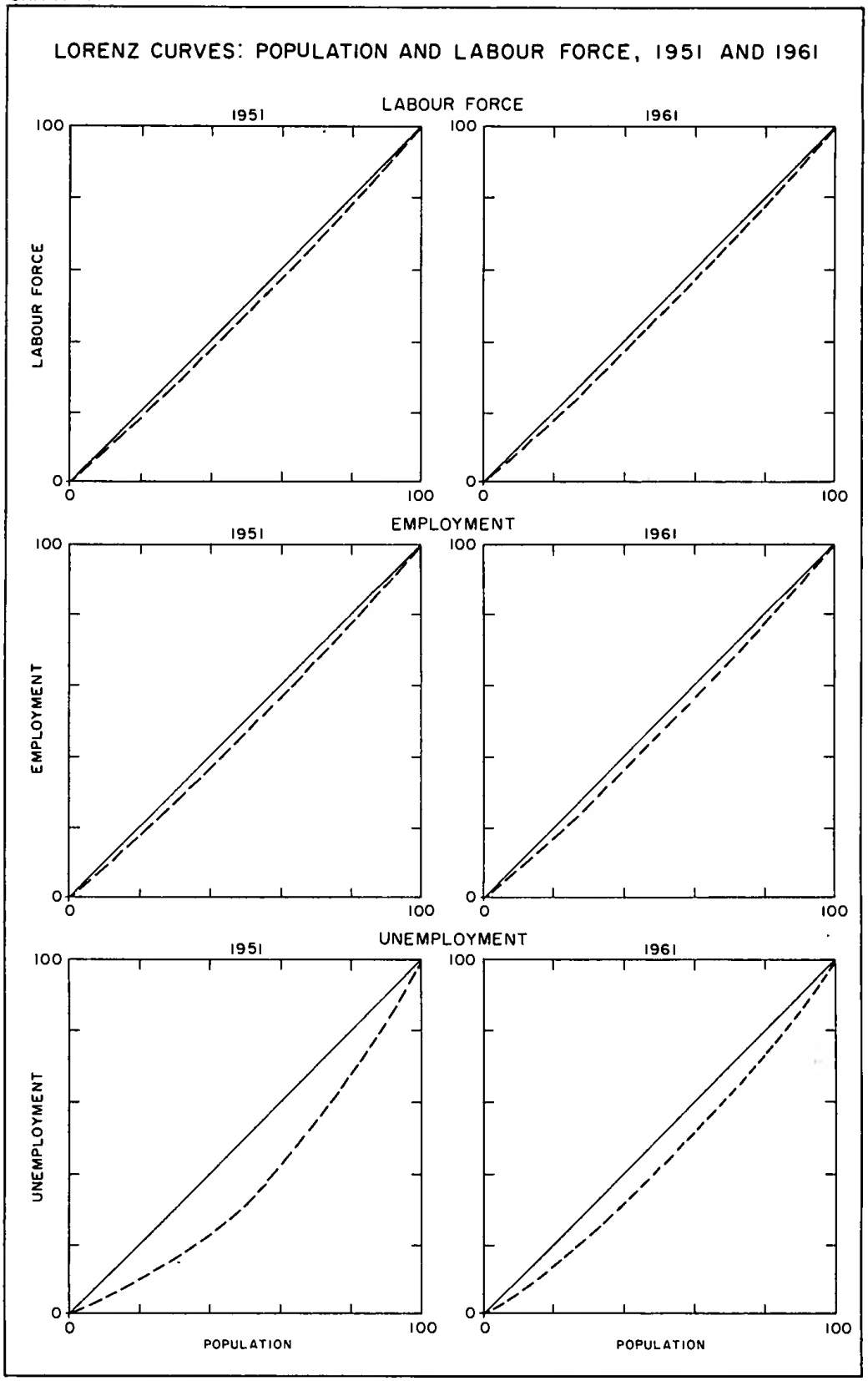
The Canadian labour force is distributed rather evenly among the provinces in relation to the total population, as Chart 1 reveals. The total provincial population, in other words, is a reliable indicator of a province's volume of economic activity, at least as that is revealed by labour market activity. This is seen, too, in the provincial distribution of employment; here again, the Lorenz curve shows only a slight degree of inequality. Unemployment, however, is very unequally spread across the country, as may

---

[1] It is most common to order observations from low to high values of the ratios (in which case the resulting curve is concave upward) but the reverse ordering is equally valid and provides a curve which is concave downward.

[2] See G.B. Hainsworth "The Lorenz Curve as a General Tool of Economic Analysis", *Economic Record*, October 1964, especially pp. 429-431. The Gini indexes used in this Study were calculated by a method developed by the staff of the Survey Research Center, University of Michigan. Algebraically identical but computationally more cumbersome formulae are found in a number of standard texts. Cf. especially Maurice Kendall, *The Advanced Theory of Statistics*, London, 1947, pp. 44-45.

CHART-I


LORENZ CURVES: POPULATION AND LABOUR FORCE, 1951 AND 1961
LABOUR FORCE
1951
1961
EMPLOYMENT
1951
1961
UNEMPLOYMENT
1951
1961
LABOUR FORCE
EMPLOYMENT
UNEMPLOYMENT
POPULATION
POPULATION
0
100

be seen by the Lorenz curves in Chart 1 relating the distribution of unemployment and total population for both 1951 and 1961. However, judging from these data, unemployment was somewhat more evenly distributed in 1961 than in 1951.[1]

These general observations are borne out by the Gini indexes in Table 1. An index of zero would imply perfect equality of distribution or a constant relationship between the two variables. Thus, as may be seen, the indexes for both labour force and employment (in relation to total population) are close to zero while those for unemployment are much higher. As would be expected, the female labour force (and employment) is more unequally distributed geographically than is the male or total working population.[2] Bearing in mind the problem of comparability of data from the two censuses, there does not appear to have been any marked change – perhaps a very small increase in concentration – in the provincial distribution of the total working population or total employment. The female labour force and female

[1] There are problems of comparability of 1951 and 1961 Census labour force – especially unemployment – data. (See another Study in this Series, *Unemployment in Canada*, Ottawa: Queen's Printer, 1968). But the shift in the Lorenz curve shown in Chart II may also be observed when labour force survey data are used and emerges, too, when smaller geographic units – counties and census divisions – form the unit of observation. See Frank T. Denton and Sylvia Ostry, *An Analysis of Post War Unemployment*, Economic Council of Canada, Staff Study No. 3.

[2] Cf. *Provincial Differences in Labour Force Participation* by Sylvia Ostry, one of a Series of Labour Force Studies in the 1961 Census Monograph Programme (Ottawa: 1968) for discussion of male-female differences in provincial dispersion of activity rates.

## Table 1 – Gini Indexes, Provincial Distributions of Total Population, Labour Force, Employment and Unemployment, 1951 and 1961

NOTES – All tables are based on 1951 and 1961 (or earlier) census data. All statistics exclude the Yukon and Northwest Territories. See footnote[2], p. 3, for computation of Gini indexes.

| Year and sex | Component | | |
|---|---|---|---|
| | Labour force and total population | Employment and total population | Unemployment and total population |
| | (1) | (2) | (3) |
| **1951** | | | |
| Both Sexes | .038 | .043 | .232 |
| Males | .031 | .036 | .265 |
| Females | .081 | .082 | .140 |
| **1961** | | | |
| Both Sexes | .042 | .046 | .115 |
| Males | .033 | .038 | .139 |
| Females | .068 | .069 | .114 |

employment, however, were more equally distributed among the provinces (in relation to total population) in 1961 than in 1951. The decline in concentration of unemployment has already been noted.

Finally, it is of some interest to place the 1951-61 decade in a broader historical context. Roughly comparable historical data on the labour force[1] but not on its components (employment and unemployment) are available for the Canadian provinces for the period since 1911. The Gini indexes displayed in Table 2 reveal that there was a very sharp drop in the provincial concentration of the working population between 1911 and 1921 and thereafter a moderate decline in inequality until 1951. As observed above, however, the decade of the 1950s witnessed a slight rise in concentration – now apparent as a reversal, or perhaps merely a temporary cessation, of a long-run trend.

**Table 2 – Gini Indexes, Provincial[a] Distribution of Labour Force and Total Population, 1911 to 1961**

| Year | Gini Index | Year | Gini Index |
|---|---|---|---|
| 1911 ..... | .068 | 1941[b] ..... | .027 |
| 1921 ..... | .038 | 1951 ..... | .035 |
| 1931 ..... | .034 | 1961 ..... | .037 |

[a] Excluding Newfoundland. [b] Excluding persons on active service June 2, 1941.

These findings are illuminated by comparison with the results of an analysis of interprovincial dispersion of labour force participation rates presented in another study in this series, *Provincial Differences In Labour Force Participation.*[2] What appeared to be a marked decline in dispersion between 1911 and 1921 was shown to be entirely due to compositional factors, *viz.*, the "peculiar" age-sex structure of the population of the West in 1911 – a structure characteristic of a frontier economy, heavily dominated by prime age males.[3] Between 1911 and 1921 the structure was pretty well normalized as a consequence of heavy migration (mainly from Europe) into the three Prairie Provinces during the years preceding the First World War.

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[1] See, however, Frank T. Denton and Sylvia Ostry, *Historical Estimates of the Canadian Labour Force*, one of a Series of Labour Force Studies in the 1961 Census Monograph Programme (Ottawa: 1967) for a discussion of the relevance of changing concepts in census estimates of the economically active population.

[2] By Sylvia Ostry, *op. cit.*

[3] *Ibid.*, pp. 17-19.

The decline in the Gini indexes between 1911 and 1921, then, can be largely explained by the rapid growth of, and attendant structural change in, the population of Western Canada. On the other hand, the reasons for the slight rise in concentration between 1951 and 1961 (as evidenced by the increase in the Gini indexes noted above) appear to be related to genuine changes in the interprovincial pattern of labour force propensities since there was also a (small) rise in dispersion of both the "raw" and "standardized" participation rates over that decade.[1]

## MAJOR OCCUPATIONS AND INDUSTRIES

While total employment is fairly evenly distributed among the provinces in relation to total population and working population,[2] this is by no means true of all the major occupation and industry groups in the labour force. This is evident both from Chart 2 and from the Gini indexes in Table 3.

**Table 3 – Gini Indexes, Provincial Distributions of Labour Force, by Occupation and Industry Group, 1951 and 1961**

| Occupation (as of 1961) | Index | | Industry (as of 1961) | Index | |
|---|---|---|---|---|---|
| | 1951 | 1961 | | 1951 | 1961 |
| Managerial | .045 | .046 | Agriculture | .301 | .320 |
| Professional and technical | .040 | .027 | Forestry | .439 | .415 |
| Clerical | .110 | .081 | Fishing and trapping | .716 | .689 |
| Sales | .049 | .041 | Mines, quarries and oil wells | .301 | .186 |
| Service and recreation | .056 | .058 | Manufacturing | .190 | .165 |
| Transportation and communication | .053 | .049 | Construction | .053 | .046 |
| Farmers | .298 | .314 | Transportation and communication | .050 | .071 |
| Loggers | .457 | .423 | Trade | .049 | .038 |
| Fishermen | .726 | .707 | Finance and insurance | .123 | .097 |
| Miners | .319 | .181 | Community and personal services | .038 | .022 |
| Craftsmen and kindred workers | .111 | .085 | Public administration and defence | .131 | .117 |
| Labourers | .082 | .071 | | | |

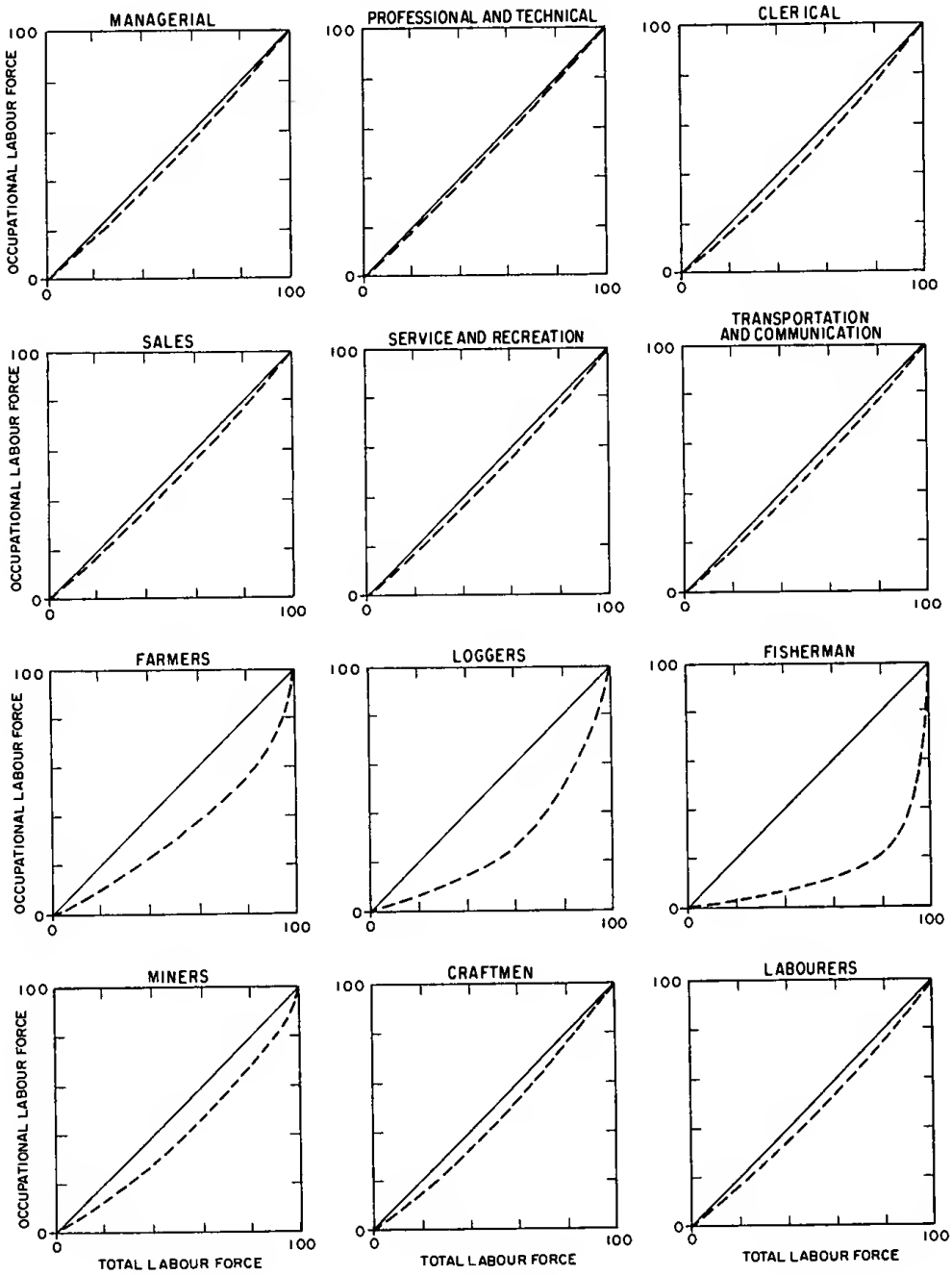
Some occupations and industries are clearly ubiquitous, distributed among the provinces fairly evenly in accordance with total labour force. Relatively equal distribution is characteristic of some of the white-collar occupations (managerial, professional and technical, sales), of service occupations and of transportation and communication occupations. Clerical

[1] *Ibid.*, pp. 19-20.

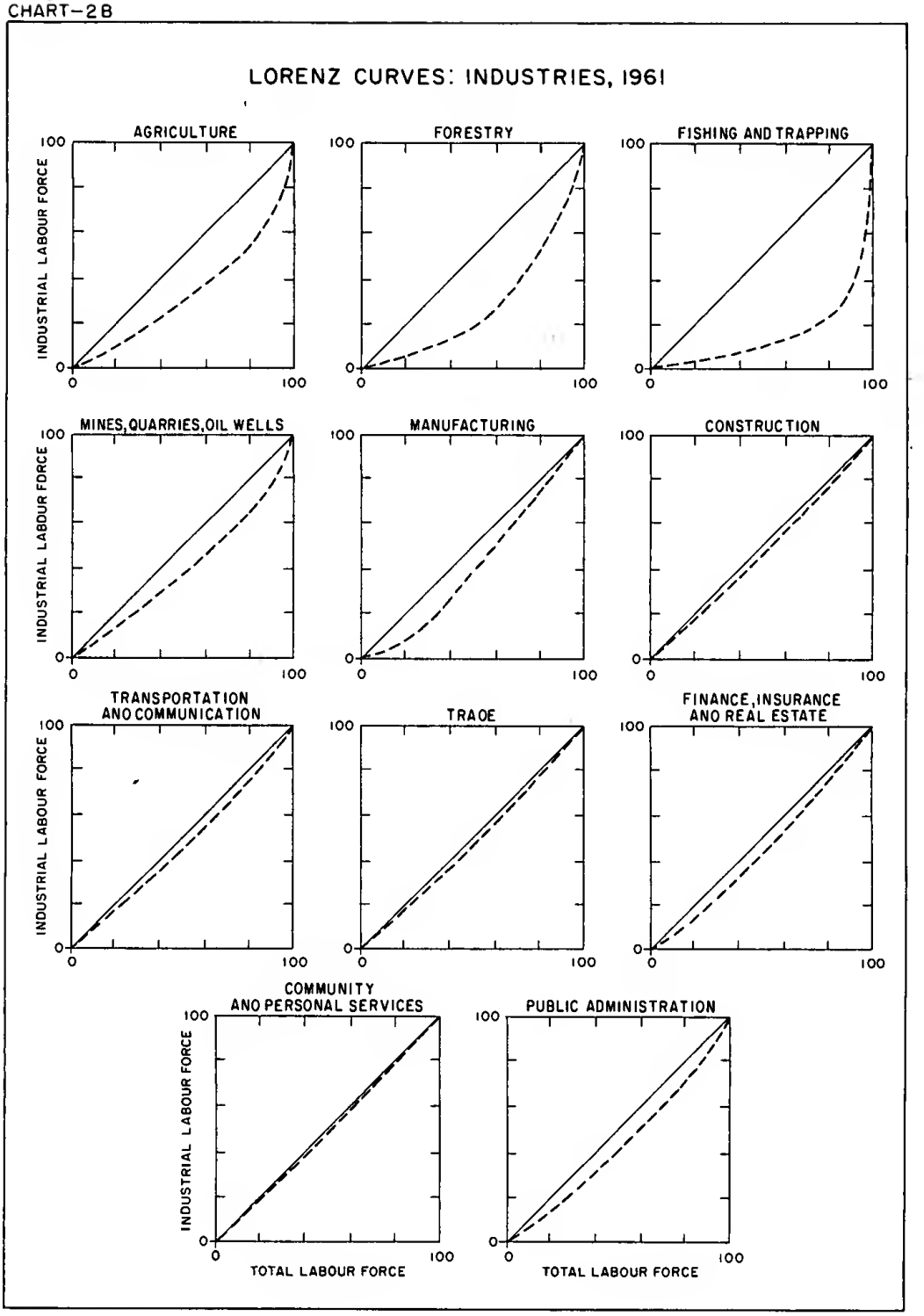
[2] The distribution of employment in relation to labour force among the provinces is almost perfectly equal: the Gini index in 1951 was .005; in 1961, it was .006.

CHART-2A

## LORENZ CURVES: OCCUPATIONS, 1961



CHART–2B


LORENZ CURVES: INDUSTRIES, 1961
AGRICULTURE
FORESTRY
FISHING AND TRAPPING
MINES, QUARRIES, OIL WELLS
MANUFACTURING
CONSTRUCTION
TRANSPORTATION AND COMMUNICATION
TRADE
FINANCE, INSURANCE AND REAL ESTATE
COMMUNITY AND PERSONAL SERVICES
PUBLIC ADMINISTRATION
INDUSTRIAL LABOUR FORCE
TOTAL LABOUR FORCE
0
100

workers are less evenly distributed geographically than the other white-collar groups: as is evident from Table 3, in this respect they resemble more closely the two blue-collar groups. The resource-based occupations are, as one would expect, the most concentrated geographically. On the industry side a similar picture emerges. In general, the service-producing industries[1] are relatively evenly spread across the provinces in relation to total labour force. This is also true of construction activity. The manufacturing labour force is somewhat more concentrated provincially but the most unequal distribution by province is found in the resource industries.

The general reasons for this variation in the provincial pattern of distribution of different occupational or industrial activity are obvious and need little elaboration. Service-producing industries, and much white-collar occupational activity, are strongly oriented to final markets and consequently the volume of these activities in any given province is roughly proportional to the total volume of economic activity and to total population. The manufacturing aggregate conceals a great diversity of activity. Some manufacturing industries (and manual occupations) are resource-tied and would therefore tend to be more concentrated geographically than those for which access to final markets (or to manufactured inputs) is the dominant locational factor. Finally, the resource-based industries and occupations require access to "immobile inputs"– fish, forests, minerals, arable land– and thus the degree of geographic concentration of this activity will reflect the geographic (in this instance, provincial) distribution of these resources.[2] Some resources are more ubiquitous than others. In Canada some type of mineral is found in most provinces[3] but commercial fishing is largely restricted to the two coastal regions. Arable land – using that term within the context of commercial agriculture – is also relatively concentrated in this country and so, therefore, is agricultural activity. However, the resource-link in agriculture is weakened as other inputs, especially machinery, bear an increasing weight in the productive process.[4]

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[1] This designation includes transportation and communication, trade, finance and insurance, community and personal services and public administration and defence.

[2] This is a great over-simplification of course, since, within the general framework established by the physical distribution of resources, considerable scope for variation in the degree of exploitation, depending on economic factors, will exist. For a full discussion of the distribution of economic activities see Harvey S. Perloff, Edgar S. Dunn, Jr., Eric E. Lampard and Richard F. Muth, *Regions, Resources and Economic Growth* (Baltimore: 1960), Part IV.

[3] Again, the mining aggregate conceals considerable diversity of activity. Included in it are completely ubiquitous resources such as construction sand, found and extracted in every province, as well as the less widely distributed minerals for which deposits are found in only a few locations. A very different picture of geographic distribution of mining activity would emerge if observations were ordered on the basis of units below the provincial level.

[4] Cf. John Dawson, *Changes in Agriculture to 1970*, Economic Council of Canada, Staff Study No. 11 (Ottawa: 1964).

As the Gini indexes in Table 3 reveal, there was some decline in geographic concentration in most major occupations and industries over the past intercensal decade. In almost every instance, the decline in inequality of distribution was very slight: it was most marked in mining activity, a direct consequence of the exploitation of oil in the Prairies, and especially Alberta, initiated during this period. It should be noted that workers in farming occupations and in the agricultural industry were *less* evenly distributed provincially in 1961 than in 1951, a development that ran counter to the general trend.

Finally, the longer-run picture again presents some contrast with the 1951-61 developments. Gini indexes were estimated for the major occupation[1] groups (comparable industry data were not available) for nine provinces (excluding Newfoundland) for each census date from 1911 to 1961 and are presented in Table 4.

**Table 4 – Gini Indexes, Provincial[a] Distribution of Labour Force, by Occupation[b] Group, 1911 to 1961**

| Occupation (as of 1951) | Year | | | | | |
|---|---|---|---|---|---|---|
| | 1911 | 1921 | 1931 | 1941[c] | 1951 | 1961 |
| Proprietary and managerial | .075 | .065 | .061 | .052 | .044 | .041 |
| Professional | .066 | .078 | .064 | .069 | .038 | .027 |
| Clerical | .120 | .128 | .134 | .156 | .107 | .078 |
| Commercial | .095 | .086 | .084 | .067 | .040 | .039 |
| Financial | .090 | .156 | .138 | .162 | .149 | .112 |
| Service | .055 | .054 | .060 | .043 | .057 | .059 |
| Transportation and communication | .078 | .095 | .093 | .077 | .051 | .054 |
| Agricultural | .161 | .187 | .214 | .234 | .289 | .306 |
| Fishing, hunting and trapping | .573 | .627 | .474 | .460 | .569 | .571 |
| Logging | .420 | .500 | .457 | .425 | .435 | .404 |
| Mining and quarrying | .512 | .587 | .488 | .353 | .313 | .168 |
| Manufacturing and mechanical | .190 | .210 | .195 | .191 | .152 | .121 |
| Construction | .079 | .119 | .125 | .124 | .072 | .061 |
| Labourers | .119 | .152 | .137 | .121 | .084 | .066 |

[a] Excluding Newfoundland. [b] As of 1951 classification. [c] Excluding persons on active service June 2, 1941.

As may be seen from Table 4 and as was noted above, with the exception of agricultural activity, the 1951-61 decade was characterized by declines in concentration for most major occupation groups, declines that were generally modest except in the case of mining. Over the longer-run, however, no such clear-cut tendency is discernible. Thus, some occupations exhibit wide "swings" in the degree of concentration from decade

[1] Grouped in terms of the 1951 Census classification of occupations which differs, though not to any fundamental degree, from the 1961 system of classification shown in the preceding Table. Cf. Sylvia Ostry, *The Occupetional Composition of the Canadian Labour Force*, one of a Series of Labour Force Studies in the 1961 Census Monograph Programme (Ottawa: 1967), for discussion and use of the two systems.

to decade while for others a consistent tendency may be observed only for a part of the period. A persistent rise or fall in concentration over the entire half-century is the exception rather than the rule. A few examples will illustrate these general observations.

Within the white-collar sector (the managerial, professional, clerical, commercial and financial occupations) only the managerial and commercial (sales) exhibit a consistent tendency toward increased equality of distribution, in relation to total labour force, among the nine provinces. The Gini indexes for these two occupation groups decline steadily from 1911 to 1961, although the decline is more marked in some decades than in others. The other three major white-collar groups (professional, clerical and financial) all exhibit some (though a by no means consistent) rise in concentration between 1911 and 1941. During the 1940s, however, these developments were reversed. In each case there was a sharp decline in concentration and, further, this tendency (toward equalization) was continued into the 1950s. Viewing the period as a whole, it may be seen that in general white-collar activity was much more equally distributed (in relation to labour force) among the nine provinces in 1961 than in 1911 except in the case of the financial group of occupations. Despite some considerable decline in concentration of financial activity since 1941, these occupations were more equally distributed across Canada in 1911 than they were fifty years later.

A marked decline in concentration after 1941, especially during the 1950s, was also characteristic of the blue-collar or manual sector (manufacturing and mechanical, construction and labourer). No doubt the similarity of these developments in manual and white-collar activity over this period is explained by the fact that both are related to a common "causal" factor – the heightened pace of industrialization of this country stimulated by the Second World War. It is of some interest to note, in this connection, that the war years were also marked by a reduction in dispersion of per capita income among the provinces, a development which is attributed to "... the policy of decentralization of war production and military establishments, the uniformity in pay scales for the armed forces, the introduction of family allowances, and the heightened activity in Atlantic seaports which served to stimulate incomes in the provinces of the regions".[1]

Perhaps the most striking trend displayed in Table 4 is the consistent, decade by decade, rise in concentration of agricultural occupations in Canada over the past half century. This development stands out in marked contrast with the experience of the other primary occupation groups which either exhibit no trend (such as fishing and logging) or a decided tendency toward greater provincial equality, as is the case for mining after 1941.

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[1] Chernick, *op. cit.*, p. 10.

The agricultural labour force in Canada has become more and more concentrated in the Prairies, in particular in Saskatchewan. This increased geographic concentration has occurred within a context of a continuing relative (and, after 1941) a substantial absolute decline in the numbers engaged in farming occupations in the country as a whole. The reasons for both these fundamental and interrelated changes in the Canadian economy – the shift from farm to non-farm activity and the growing geographic concentration of agriculture – have been detailed elsewhere[1] and will not be repeated here. It is worthy of mention, however, that both trends are expected to continue into the 1970s, i.e., the continued decline in the size of the agricultural labour force in Canada is expected to take place in areas "... other than the Prairie Provinces".[2]

---

[1] For example, cf. *The Occupational Composition of the Canadian Labour Force* and references cited therein; Dawson, *op. cit.*; Economic Council of Canada, *Fourth Annual Review*, (Ottawa: 1967), Chapter 8, "Manpower in the Primary Industries", *Rural Canada in Transition*, edited by M.A. Tremblay and W.J. Anderson, Agricultural Economic Research Council of Canada, June 1966.

[2] Dawson, *op. cit.*, p. 26.

# 2. *The Occupational and Industrial Structure of the Provinces*

The previous section dealt with the provincial distribution of the major occupational and industrial groups. This portion of the Study approaches essentially the same data from a different angle: what are the main differences in the occupational and industrial *structures* of the ten provinces? The term structure implies a pattern – the interrelations that emerge from the identification and arrangement of component parts. Here the pattern is the distribution of economic activity within the ten provinces (as it is revealed in the deployment of manpower – by industry and occupation) and the technique that is used to identify and describe these patterns is the comparison of the structure of the labour force in the provinces with the Canadian labour force.

This analysis is designed to answer two general questions, which may be simply stated and briefly answered. How do the provincial structures of economic activity (in the sense in which that term is used here, i.e., in respect to the occupational and industrial distribution of the labour force) compare with the Canadian or average structure? Secondly, has there been, on average and in specific instances, a convergence or divergence of provincial structures toward the Canadian? The basic measure used here is the sum of the (plus or minus) percentage point deviations of the provincial percentage shares of each occupation or industry group from the total (Canada) labour force share of the corresponding occupation or industry group.[1] If this "index" is large for a given province, the structure of economic activity in that province differs substantially from the Canadian average, and–since the national standard serves here as a yardstick – from that of other provinces. From another viewpoint this index measures the proportion (expressed as a percentage) of the provincial labour force which would have to be shifted to make the structure of the province's work force identical with that of Canada. Comparison of the (unweighted) average of the provincial indexes at different points in time reveals whether there has been an overall tendency toward convergence or divergence of provincial structures. A weighted average index (the weights being provincial shares of the total Canadian labour force) provides a measure of the total number of workers who would have to be shifted to a complete "restructing" of the provincial work force to achieve conformity.

[1] Cf. Simon Kuznets, Ann Ratner Miller and Richard A. Easterlin, *Population Redistribution and Economic Growth, United States, 1870-1950*, Vol. II (Philadelphia: 1960).

As Table 5 shows, not unexpectedly, the four Atlantic Provinces and the three Prairie Provinces are most dissimilar, in their structure of economic activity, from the over-all Canadian structure. The two central provinces, Quebec and Ontario, and the Pacific province, British Columbia, most closely resemble the Canadian average distribution of the labour force in terms of both industry and occupation. The weighted average provincial deviations are, in each of the two years shown, lower than the unweighted – a consequence of the fact observed above, that the two largest provinces are rather similar in structure to each other and to Canada. (In fact, of course, because of the concentration of economic activity in Central Canada, the Canadian "average structure" is strongly influenced by the structure of the two central provinces.) As the final column of Table 5 shows, by 1961 a complete conformity of the economic structures of the ten provinces would require shifting of almost 20 per cent of the Canadian labour force. Further, relative to the labour force of some of the small provinces the magnitude of such shifts is enormous. Thus, roughly one half of the labour force in Newfoundland, Prince Edward Island or Saskatchewan would have to be reallocated among the major industries to bring the industrial structures in those provinces in line with the Canadian.

**Table 5 – Percentage Point Deviations of Provincial Industrial[a] and Occupational[b] Distributions from those for Canada, 1951 and 1961**

| Category and year | Nfld. | P.E.I. | N.S. | N.B. | Que. | Ont. | Man. | Sask. | Alta. | B.C. | Provincial average deviation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Unweighted | Weighted[c] |
| **Industry** | | | | | | | | | | | | |
| 1951 ..... | 30.7 | 27.3 | 15.2 | 11.8 | 7.4 | 9.0 | 14.7 | 33.3 | 21.2 | 12.0 | 18.2 | 12.2 |
| 1961 ..... | 25.3 | 23.8 | 14.6 | 12.0 | 6.6 | 5.9 | 11.5 | 26.7 | 15.7 | 9.0 | 15.1 | 9.4 |
| **Occupation** | | | | | | | | | | | | |
| 1951 ..... | 26.2 | 27.5 | 14.4 | 11.0 | 5.6 | 7.6 | 10.2 | 33.2 | 18.0 | 9.6 | 16.4 | 10.4 |
| 1961 ..... | 17.0 | 22.6 | 13.0 | 10.7 | 5.6 | 4.9 | 8.7 | 26.7 | 11.7 | 6.3 | 12.7 | 7.8 |

[a] Major industry groups: agriculture; forestry; fishing and trapping; mining; manufacturing; construction; transportation, communication and utilities; trade; finance, insurance and real estate; community, business and personal service, public administration and defence. Classification as of 1961. [b] Major occupation groups: managerial; professional and technical; clerical; sales; craftsmen, production process and related; farmers and farm workers; loggers and related; fishermen, trappers, hunters; miners and quarrymen; transport and communication; service and recreation. Classification as of 1961. [c] Weighted by provincial share of total Canadian labour force.

The largest provincial deviations (those of Saskatchewan, Prince Edward Island and Newfoundland) are attributable to very high proportions of primary activity – agriculture in Saskatchewan and Prince Edward Island

and fishing in Newfoundland. As the labour force engaged in primary activity has shrunk over the 1951-61 decade, the industrial and occupational structures of these provinces have converged to some degree toward the Canada structure,[1] although the differences remain substantial, particularly in Saskatchewan. The same tendency toward convergence of provincial industrial and occupational structures between 1951 and 1961 may be observed in the average provincial deviations.

Over the longer-run period, from 1911, the indexes of deviation can be estimated for occupations only.[2] They are presented in Table 6. It is apparent that there has been a not inconsiderable convergence in the occupational structures of the nine provinces over the half-century from 1911 to 1961; the average deviation dropped from 32.2 to 25.5 over that period.[3] In 1911, almost one quarter of the work force would have had to be reallocated to achieve complete conformance in occupational deployment among the nine provinces; in 1961, this result would have required shifting approximately 18 per cent of Canadian workers.

As may be seen from Table 6, the tendency toward convergence of occupational structures was not uniform from decade to decade. Between 1911 and 1921, and again between 1931 and 1941, both measures of average deviation rose. In the earlier period the increased divergence is observed in six of the nine provinces but is especially marked in the central provinces and in Saskatchewan and Alberta. To a large extent these changes stem from developments in the agricultural sector. Over this decade the labour force share of farming occupations shrank more sharply in Ontario and Quebec than in the country as a whole but rose in both Saskatchewan and Alberta, for this was the height of the great "wheat phase" of Western development, punctuated at its conclusion by the war-stimulated buoyancy of the economy as a whole.

However, as may be observed from the lower half of Table 6, the rapid growth of agriculture in the two Prairie Provinces does not tell the whole story of their structural divergence from the country as a whole during the 1911-21 decade. Thus the index of deviation for the non-agricultural labour

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[1] The decline in agriculture in Saskatchewan may be somewhat overstated because 1961 was an exceptionally bad crop year. Further, the marked decline in fishing (industry and occupation) in Newfoundland may also be overstated because of differences in measurement of seasonal workers in the 1951 and 1961 Censuses.

[2] There are no historical statistics of the labour force classified on a comparable industrial basis. See, however, Marvin McInnis, *The Changing Industrial Composition of the Canadian Work Force, 1921-1961*, Paper presented to the University of Toronto Economic History Workshop, March 1967 (mimeographed). Preliminary results of a project to develop a consistent industrial series from census data are discussed.

[3] Cf. S.E. Chernick, *op. cit.*, for evidence of only very slight convergence in the interregional structure of per capita income over the period 1927 to 1963 (p. 8).

force rose markedly in both provinces, reflecting above-average growth in some of the white-collar and service occupations. A more intensive analysis – ideally utilizing industrial employment and output data – would be required to reveal the link between these developments and the rapid proliferation of farming occupations in Western Canada.

**Table 6 – Percentage Point Deviations of Provincial[a] Occupational[b] Distributions from those for Canada,[a] 1911 to 1961**

| Year | P.E.I. | N.S. | N.B. | Que. | Ont. | Man. | Sask. | Alta. | B.C. | Provincial average | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Percentage point deviations: total labour force | | | | | | | | | Unweighted | Weighted |
| 1911 | 30.5 | 15.8 | 9.6 | 5.7 | 5.5 | 11.3 | 29.5 | 16.4 | 25.8 | 16.7 | 11.9[c] |
| 1921 | 29.7 | 14.3 | 10.5 | 7.4 | 8.6 | 11.6 | 32.5 | 22.6 | 18.4 | 17.3 | 14.7[c] |
| 1931 | 31.7 | 13.6 | 12.5 | 8.4 | 8.0 | 7.9 | 31.7 | 23.9 | 15.6 | 17.1 | 13.9[c] |
| 1941[d] | 31.4 | 16.0 | 13.6 | 7.1 | 9.3 | 10.7 | 33.6 | 24.2 | 14.6 | 17.9 | 14.1[c] |
| 1951 | 27.8 | 16.0 | 12.5 | 5.6 | 7.5 | 10.1 | 33.0 | 17.6 | 11.8 | 15.8 | 11.5[c] |
| 1961 | 22.8 | 14.3 | 12.0 | 5.6 | 5.4 | 7.8 | 27.1 | 11.9 | 7.9 | 12.8 | 8.9[c] |
| | Percentage point deviations: non-agricultural labour force | | | | | | | | | | |
| 1911 | 16.6 | 20.5 | 11.2 | 5.9 | 5.7 | 14.8 | 16.2 | 14.3 | 16.0 | 13.5 | 10.6[e] |
| 1921 | 16.9 | 17.1 | 13.6 | 6.4 | 5.4 | 13.5 | 20.2 | 16.3 | 10.2 | 13.3 | 9.9[e] |
| 1931 | 13.7 | 16.3 | 13.6 | 5.0 | 5.5 | 7.1 | 14.9 | 12.6 | 8.6 | 10.8 | 8.2[e] |
| 1941[d] | 20.4 | 16.4 | 16.7 | 5.9 | 6.6 | 9.8 | 20.3 | 14.0 | 8.6 | 13.2 | 9.5[e] |
| 1951 | 17.6 | 15.8 | 15.0 | 5.1 | 5.2 | 7.1 | 17.8 | 12.1 | 6.3 | 11.3 | 7.8[e] |
| 1961 | 14.8 | 13.0 | 11.6 | 4.7 | 4.0 | 5.6 | 11.6 | 7.9 | 5.0 | 8.7 | 6.2[e] |

[a] Excluding Newfoundland. [b] As of 1951 Classification. [c] Weighted by the provincial share of the total Canadian labour force. [d] Excluding persons on active service June 2, 1941. [e] Weighted by the provincial share of the Canadian non-agricultural labour force.

During the 1930s, the depression years, the divergence of provincial occupational structures from the national average was especially marked in the non-agricultural sector (see the lower half of Table 6). Once again the Prairies and especially Saskatchewan, which had suffered the most from the collapse of world markets for wheat, experienced the most severe effects of the general decline in economic activity. But in the country as a whole (including the industrialized central provinces), the powerful centrifugal effects of the Depression may be seen in the increasing dissimilarity of provincial structures from each other and from the national pattern that had begun to emerge in the two earlier decades of expansion and prosperity.

The decades from 1941 to 1961 are once again seen as a period of growing convergence. The indexes of deviation for both the total and the non-agricultural labour force declined in every province but the decline was

generally more marked in the non-agricultural measure. The most dramatic convergence over the entire five decades is observed in the far West—in British Columbia and Alberta. By 1961 these two provinces, once notably dissimilar from the country as a whole in their deployment of manpower, now differ relatively little from the broad national pattern. The least convergence occurred in the Maritimes, which have retained their dependence on primary occupations to a far greater extent than has the rest of Canada.

# 3. *Provincial Shifts in Industrial Employment*

Thus far the analysis of geographic aspects of labour force composition has focused on distributions or structures; the provincial distributions of the labour force and its major occupational and industrial components and the industrial and occupational distribution of the ten provinces. Some tendency toward greater equality in respect to both these aspects of labour force composition has been noted, especially in more recent decades. Absence of data precludes a more intensive exploration of the changing pattern of industrial activity and the consequent reallocation of manpower which lie behind these developments. Only for the 1951-61 decade can we examine, albeit briefly, some of the significant shifts in industrial employment. A simple statistical technique – "shift analysis" – has been widely used for this purpose and will be applied, in what follows, to the Canadian data for the past intercensal decade.

## NET SHIFTS IN TOTAL EMPLOYMENT AND LABOUR FORCE

The statistical technique of "shift analysis" is a very simple one that has proved to be a most useful tool for the description and analysis of many aspects of regional development.[1] It is based on the comparison of actual and "expected" changes in a given economic dimension (in this instance, employment by industry) within a region, the "expected" change being that which would have occurred if each region had exactly recapitulated, in relative or proportionate terms, the experience of the country as a whole. The basic technique is clarified by the data in Table 7.

In Table 7 the actual total employment in Canada and each of the ten provinces in 1951 and 1961 provide the basic information for the first stage of calculation.[2] The expected employment in each of the provinces is calculated by applying the percentage change in Canadian employment over

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[1] The most extensive use of shift anslysis is found in Harvey S. Perloff, *et al.*, *op. cit.*, Parts III snd IV. See also Edgar S. Dunn, Jr., "A Statistical and Analytical Technique for Regional Analysis", Papers and Proceedings of the Regional Science Association, Volume 6, 1960, pp. 97-112, for s further exposition. The origin of the technique is attributed to Daniel Cresmer, *Industrial Location and Natural Resources*, National Resources Plsnning Board (Washington: 1942), Chspter 4. Further bibliography may be found in Dunn, *op. cit.*, p. 98 and Perloff *et al.*, p. 33.

[2] It must be noted thst the 1951 and 1961 Censuses were taken st two different stsges of the business cycle snd this would sffect some industries (and hence some regions) much more strongly than others. The distortions in the anslysis resulting from the differing cyclical effects csnnot be fully assessed.

the decade to each of the provincial totals in line (1). This is the total employment one would expect if each of the provinces had gained workers *pari passu* with the country as a whole. But clearly, each province did not have the same experience in this respect. Line (4) represents the "inward" and "outward" shifts in employment for each province. These positive (and negative) shifts can be summed – since they are represented by absolute numbers – and the shift for each province described as a percentage of the total. Thus it may be seen that the total interprovincial employment shift between 1951 and 1961 was about 168,000 workers.

**Table 7 – Net Total Employment Shift, by Province, 1951-61**

| Item | Canada | Newfoundland | Prince Edward Island | Nova Scotia | New Brunswick | Quebec |
|---|---|---|---|---|---|---|
| (1) Actual employment, 1951 | 5,198,772 | 100,998 | 33,622 | 214,869 | 164,873 | 1,438,255 |
| (2) Actual employment, 1961 | 6,246,214 | 104,037 | 33,436 | 228,551 | 169,154 | 1,703,100 |
| (3) "Expected" employment, 1961 (baaed on percentage change in Canadian employment, 1951-61) | | 121,347 | 40,396 | 258,161 | 198,091 | 1,728,033 |
| (4) Net employment shift (2) – (3)..... | +167,690 | −17,310 | −6,960 | −29,610 | −28,937 | −24,933 |
| Percentagea of total poaitive ahift..... | 100.0 | | | | | |
| Percentages of total negative ahift..... | 100.0 | 10.3 | 4.1 | 17.7 | 17.3 | 14.9 |
| (5) Net ahift as percent of actual change in employment ..... | 16.0 | 569.6 | 3.741.9 | 216.4 | 675.9 | 9.4 |

| Item | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia |
|---|---|---|---|---|---|
| (1) Actual employment, 1951 | 1,865,757 | 294,835 | 299,920 | 350,646 | 434,997 |
| (2) Actual employment, 1961 | 2,324,629 | 334,386 | 320,259 | 477,851 | 550,811 |
| (3) "Expected" employment, 1961 (based on percentage change in Canadian employment, 1951-61) | 2,241,667 | 354,238 | 360,347 | 421,294 | 522,640 |
| (4) Net employment ahift (2) – (3)..... | +82,962 | −19,852 | −40,088 | +56,557 | +28,171 |
| Percentagea of total poaitive shift..... | 49.5 | | | 33.7 | 16.8 |
| Percentages of total negative ahift ..... | | 11.8 | 23.9 | | |
| (5) Net ahift as percent of actual change in employment ..... | 18.1 | 50.2 | 97.1 | 44.5 | 24.3 |

In order to place this figure in perspective it is of interest to observe that the total net increase in employment in the country as a whole over the same period was 1,047,442. Thus the shift accounted for just over 16 p.c. of the change, indicating a rather high degree of stability of economic

activity. In the United States, over the period 1950 to 1960, the shift amounted to almost 34 per cent of the absolute rise in employment, when calculated on the basis of the 50 individual states, and 24 per cent, if calculated for the nine major regions.[1]

Returning to Table 7, it may be observed that only three provinces experienced an inward shift of employment – Ontario, Alberta and British Columbia. Ontario pulled in by far the largest share; almost half of the total shift went to that province. However, in terms of Ontario's employment base (and employment increase), which is far larger than that of the other two provinces, the relative importance of the shift was not spectacular [see line (5) of Table 7]. In Alberta, however, the shift represented almost 45 per cent of the total increase in employment over the period and in British Columbia the corresponding figure was just under 25 per cent.

Each of the other seven provinces experienced a net "loss", in the sense used here of an outward shift of employment. Almost one quarter of the total net outward shift was suffered by Saskatchewan and another 12 per cent by Manitoba, both neighbours of the more fortunate Alberta. Each of the Atlantic Provinces also experienced outward shifts, more severe (at least in absolute terms) in Nova Scotia and New Brunswick. In each of the Atlantic Provinces, as line (5) of the Table shows, the shifts in total employment were greater than the actual change in total employment – most dramatically so in Prince Edward Island, Newfoundland and New Brunswick. In Saskatchewan the shift was almost double the actual increase. Only in Quebec was it relatively insignificant when compared with the total increase in employment over the decade. These differences reflect, of course, the very large differences in the employment base in the various provinces.

Before going on with the analysis of employment shifts by industry it is of some interest again to glance at a longer-run view of these over-all shifts to improve the perspective of the 1951-61 decade. Table 8 provides decade-by-decade estimates of shifts in the labour force[2] for nine provinces (excluding Newfoundland) from 1911 to 1961.

First, it may be observed that the total net shift in the labour force for Canada has not represented a very substantial proportion of the actual change in the working population in any decade since 1911, except for the 1931-41 period which included the Depression and the early years of World

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[1] The regions are New England, Middle Atlantic, E.N. Central, W.N. Central, South Atlantic, E.S. Central, W.S. Central, Mountain and Pacific. See *United States Census of Population*, 1950 and 1960, U.S. Summary: General Characteristics.

[2] Statistics on employment were not available for the entire period. The labour force data have not been revised to a conceptually consistent base; before 1951 the censuses recorded the gainfully occupied and not the labour force. Cf. *Historical Estimates*, op. cit.

War II. For four of the five decades surveyed in Table 5 the net shift represented between 15 and 18 per cent of the actual change but this proportion reached almost 40 per cent during the 1931-41 decade, a period of stagnation and disruption which, however, terminated in a wartime year of rapid growth and change in the Canadian economy.

**Table 8 – Percentage Distribution of Net Labour Force[a] Shifts, by Province (excluding Newfoundland) and by Decade, 1911 to 1961**

| Province | 1911 to 1921 | | 1921 to 1931 | | 1931 to 1941[b] | |
|---|---|---|---|---|---|---|
| | Positive | Negative | Positive | Negative | Positive | Negative |
| Canada | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Prince Edward Island | | 7.8 | | 5.4 | | 2.8 |
| Nova Scotia | | 19.9 | | 41.2 | | 2.2 |
| New Brunswick | | 8.7 | | 20.8 | | 2.3 |
| Quebec | 25.1 | | 46.6 | | 87.0 | |
| Ontario | | 39.0 | | 32.6 | 13.0 | |
| Manitoba | 11.6 | | 1.9 | | | 21.5 |
| Saskatchewan | 28.1 | | 8.1 | | | 42.2 |
| Alberta | 35.2 | | 15.0 | | | 16.4 |
| British Columbia | | 24.6 | 28.4 | | | 12.5 |
| Total shift (for Canada as percent of actual change) | 18.0 | | 15.4 | | 40.0 | |
| | 1941[b] to 1951 | | 1951 to 1961 | | 1911 to 1961 | |
| | Positive | Negative | Positive | Negative | Positive | Negative |
| Canada | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Prince Edward Island | | 2.9 | | 4.5 | | 7.5 |
| Nova Scotia | | 10.0 | | 19.8 | | 30.7 |
| New Brunswick | | 7.8 | | 16.8 | | 18.6 |
| Quebec | 4.6 | | | 19.2 | 46.2 | |
| Ontario | 58.2 | | 48.2 | | 15.8 | |
| Manitoba | | 19.4 | | 13.5 | | 13.4 |
| Saskatchewan | | 58.4 | | 26.1 | | 29.8 |
| Alberta | | 1.5 | 32.5 | | 20.5 | |
| British Columbia | 37.2 | | 19.2 | | 17.5 | |
| Total shift (for Canada as percent of actual change) | 15.3 | | 14.5 | | 14.8 | |

[a] Prior to 1951 the gainfully occupied definition was used in the census.
[b] Excluding persons on active service.

Another interesting characteristic of the geographic pattern of growth in Canada that emerges from Table 8 is that the "gains" (net inward shifts) have tended to be more concentrated than the "losses" (net outward shifts). This tendency is observable over the past three decades, since 1931. In the earlier part of the century, gains and losses were relatively more dispersed but in the later period two or three provinces enjoyed the

lion's share of labour force "inflow", while losses were spread somewhat more evenly over the others.

Although no province enjoyed an above-average growth of the labour force in every one of the five decades, there were some persistent "losers" over the entire fifty-year period. Thus, and most notably, the Maritime region has been in relative decline since 1911, with a combined net downward shift of 57 per cent of the total between 1911 and 1961. The two Prairie Provinces, Manitoba and Saskatchewan, were also net losers over the long haul. The only marked exception was the earliest decade, 1911 to 1921, when they enjoyed the effects of the growing wheat economy and the wave of European immigration which flowed into the Canadian West. The serious effect of the Depression, which was not mitigated even by the war or the postwar boom is reflected in the severe (relative) "losses" suffered by these provinces over the 1931-41 and 1941-51 decades. Alberta and British Columbia have demonstrated rather more volatile relative growth rates. However, over the past two intercensal decades British Columbia has enjoyed a respectably large share of the net gains and Alberta, over the period 1951-61, pulled in almost one third of the net positive shift.

Perhaps the most surprising finding of this longer-run analysis is the contrasting experience of Quebec and Ontario. In four of the five decades, Quebec shared in – sometimes dominated – the net inward shifts of working population. Ontario, on the other hand, enjoyed a substantial share of the gains only over the past two decades. Quebec's relative growth advantage declined as Ontario's rose, since 1941. The relative decline of Quebec coincides with the rapid growth of Ontario and the two far western provinces. On balance, over the entire fifty years, Quebec's labour force grew at a faster rate than the Canada average but at a rate well below that of Ontario.

Finally, it is well to note (and that was the chief purpose of this brief incursion into the historical data) that the 1951-61 decade – the most recent intercensal period – differs in some fundamental respects from earlier periods in this century. The shift of the economically active population to the Pacific Coast and to Alberta is a relatively recent phenomenon or, perhaps it is fairer to say, it is a phenomenon that was observable earlier in the century but was interrupted during the Depression. The relatively rapid growth of Quebec, so marked in the earlier decades, was eclipsed by Ontario during the 1940s and 1950s. Only the Maritime region displayed a consistent pattern of development – unfortunately, a consistent decline – over the entire half-century.

## REGIONAL AND STRUCTURAL SHIFTS IN EMPLOYMENT: 1951 TO 1961

While further analysis of longer-run trends is precluded by lack of data, it is possible to delve more deeply into the analysis of the changing distribution of employment over the 1951-61 decade. Thus, one can distinguish two types of change that contribute to the total net employment shift by province. If, for example, a province enjoys a net inward employment shift over a given period of time, this may be because the rate of growth of a good many industries in that province is greater than the national average. In other words, because of conditions *indigenous to the province*, a number of sectors of employment in that province will grow more rapidly. This may be called the *net regional effect*. But a province may enjoy a net inward employment shift (or suffer the reverse) not because of its generally favourable growth conditions but because its *structure* of employment is heavily weighted by rapid growth (or, in the reverse case, slow growth) sectors. This may be termed *net structural effect*.[1] In this instance, the net inward shift arises not from regional factors but rather from national or even international market influences or pervasive changes in technology which shape the relative growth rates of different industries.

It is very important to stress that one limitation of the shift analysis is that the exact allocation of total net employment shift into "regional" and "structural" effects is affected by the level of aggregation of the underlying (in this case, industry) data. The greater the level of aggregation (and this Study employs the broadest industry groups because of almost total lack of comparable data at a finer level of detail) the larger is the share of the shift allocated to the regional effect. This point is demonstrated by the analysis, below, of some of the sub-groups within the manufacturing sector in Ontario and Quebec.

The net regional shift for each province is calculated by computing the total net inward or outward shift for each major industry group in the province[2] (Table 9) and summing these algebraically. These are shown in Table 10 for the 1951-61 decade.

Except under circumstances of the most extreme coincidence and curiosity, the net *regional* shift for a province would not match the net

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[1] Several different terms have been used to characterize these (and other) shifts. Thus Dunn *(op. cit.)* calls our regional effect the differential effect and our structural effect the proportionality effect. Harvey Perloff, in his *How a Region Grows* (with Vera W. Dodds), Committee for Economic Development, Supplementary Paper No. 17 (New York: 1963) refers to the net local-factor or net composition shift (p. 76).

[2] These are calculated in a manner exactly analogous to that described in connection with the total shifts (Table 7): the expected employment in a given industry sector in a given province is derived by applying the percentage increase for that sector in Canada to the employment base of that sector in the province. The shift for each sector is then calculated by subtracting expected from actual employment in 1961.

shift in total employment. It will usually be less than or greater than the latter and the difference between the two arises from the *structural* effect.[1] Thus, the net structural shift shown for each province in Table 10 is derived by subtracting the net regional shift from the net total employment shift.

[1] The structural shift can be calculated *ab initio* (cf. Dunn, *op. cit.*, p. 112) and Perloff *et al.*, *op. cit.*, p. 71), but here is derived simply by subtracting the net regional shift from the net total employment shift. On the premise that the two types of shift exhaust the total, (and providing the calculations of the regional shifts are correct!) the two methods of derivation should yield the same results. See Appendix.

**Table 9 – Net Total Employment Shift, Major Industry Groups, by Province, 1951-61**

| Industry group (as of 1961) | Canada | Newfoundland | Prince Edward Island | Nova Scotia | New Brunswick | Quebec |
|---|---|---|---|---|---|---|
| Agriculture | ±34,537 | - 1,043 | - 859 | -6,053 | - 8,337 | -18,245 |
| Forestry | ± 6,237 | - 1,959 | - 53 | - 237 | - 3,063 | + 2,779 |
| Fishing and trapping | ± 4,736 | - 4,007 | + 973 | +1,084 | + 632 | - 722 |
| Mines, quarries and oil wells | ±13,208 | + 61 | - 4 | -7,475 | + 85 | + 2,759 |
| Manufacturing | ±18,465 | - 2,709 | - 228 | -3,502 | - 3,385 | + 821 |
| Construction | ±11,476 | + 1,827 | + 48 | -2,983 | - 889 | + 60 |
| Transportation, communication and other utilities | ±18,394 | - 100 | - 295 | -3,439 | - 3,244 | + 5,179 |
| Trade | ±22,443 | - 363 | - 700 | -4,654 | - 1,913 | + 1,691 |
| Finance, insurance and real estate | ± 3,274 | + 452 | - 93 | - 16 | - 395 | + 427 |
| Community, business and personal service | ±54,196 | - 1,621 | - 1,670 | -6,925 | - 4,832 | -25,188 |
| Public administration and defence | ±10,657 | - 1,870 | - 564 | +1,788 | + 4,402 | - 244 |

| Industry group (as of 1961) | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia |
|---|---|---|---|---|---|
| Agriculture | +11,790 | +2,341 | + 4,800 | +14,251 | +1,355 |
| Forestry | - 925 | + 21 | + 536 | + 1,408 | +1,493 |
| Fishing and trapping | + 579 | - 7 | + 170 | + 141 | +1,157 |
| Mines, quarries and oil wells | + 7,331 | +1,048 | + 1,924 | - 778 | -4,951 |
| Manufacturing | - 7,543 | -1,098 | + 1,460 | +10,480 | +5,704 |
| Construction | - 5,298 | - 156 | + 3,981 | + 5,560 | -2,150 |
| Transportation, communication and other utilities | - 6,715 | -1,306 | - 3,295 | + 8,382 | +4,833 |
| Trade | + 8,225 | -9,502 | - 5,311 | +11,046 | +1,481 |
| Finance, insurance and real estate | + 382 | -1,753 | - 351 | + 2,013 | - 666 |
| Community, business and personal service | +39,552 | -3,840 | -10,120 | +12,104 | +2,540 |
| Public administration and defence | - 2,322 | -1,954 | + 1,003 | + 3,464 | -3,703 |

Table 10 reveals that the experiences of the provinces, over this period have varied widely. Taking first the three provinces that enjoyed a net inward shift in total employment, it may be seen that Ontario's superior "magnetism" stems from growth-stimulating conditions within the province as well as a "favourable" industrial structure (i.e., a concentration of rapid growth industries). Both effects are relatively strong, but the regional shift slightly outweighs the structural shift. Referring back to Table 9, it may be seen that the major source of the positive regional shift in Ontario was the higher-than-average growth of some of the service-producing sectors – trade and community, business and personal service. But Table 9 reveals some rather surprising facts about Ontario's growth experience over this decade. For example, agriculture contributed rather substantially to the regional part of the net inward shift in total employment. This illustrates a general point that the sources of *differential* regional growth are most varied and complex. A province may experience a net inward shift in total employment when a declining industry (agriculture, for example) declines less rapidly than in the rest of the country. Manufacturing in Ontario, on the other hand, was a source of outward employment shift, growing somewhat more slowly in that province than in the nation as a whole. The manufacturing sector will be discussed in more detail below but it should be pointed out again (see footnote [2], p. 21) that these results may have been influenced by the differential impact of the more severe cyclical unemployment in 1961 than in 1951.

British Columbia was the only other province in Canada to experience positive regional and structural shifts in employment over the 1951-61 decade. But here, unlike Ontario, the dominant effect was structural. British Columbia, in fact, was one of only two provinces (the other being Saskatchewan) in which the structural shift outweighed the regional shift, suggesting that interprovincial differences in the industrial composition of employment are not as important, at this level of aggregation of the industry data, as the growth climate in the provinces in explaining differential growth experience over this decade. This may also be seen in Table 10; the regional shift involved 130,000 workers and the structural, 78,000.

Alberta, the third province with a net inward shift in total employment, owed the positive shift entirely to a favourable regional effect, the structural shift having been negative. A glance at Table 9 shows that Alberta was unique among all the provinces in having experienced a differential growth advantage in every industry sector but one – and, rather surprisingly, the one exception was mining, quarries and oil wells. The negative shift in mining was, however, very small,[1] and it does not affect

[1] It was probably attributable to the sharp drop in coal-mining employment but there are no data below the sectoral level that would allow us to examine this further.

the conclusion that the over-all regional conditions for growth were most favourable in Alberta over this period.

**Table 10 – Allocation of Net Total Employment Shift, 1951-61 Regional and Structural Effects[a]**

| Item | Canada | Newfoundland | Prince Edward Island | Nova Scotia | New Brunswick | Quebec |
|---|---|---|---|---|---|---|
| (1) Net total employment shift | ±167,690 | −17,310 | −6,960 | −29,610 | −28,937 | −24,933 |
| (2) Net regional shift | ±130,014 | − 9,685 | −3,996 | −33,822 | −22,623 | −43,485 |
| Percentage of positive net regional shift | 100.0 | | | | | |
| Percentage of negative net regional shift | 100.0 | 7.4 | 3.1 | 26.0 | 17.4 | 33.4 |
| (3) Net structural shift | ± 77,530 | − 7,625 | −2,964 | + 4,212 | − 6,314 | +18,552 |
| Percentage of positive net structural shift | 100.0 | | | 5.5 | | 23.9 |
| Percentage of negative net structural shift | 100.0 | 9.8 | 3.8 | | 8.2 | |

| Item | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia |
|---|---|---|---|---|---|
| (1) Net total employment shift | +82,962 | −19,852 | −40,088 | +56,557 | +28,171 |
| (2) Net regional shift | +49,696 | −14,244 | − 2,159 | +73,647 | + 6,671 |
| Percentage of positive net regional shift | 38.2 | | | 56.6 | 5.2 |
| Percentage of negative net regional shift | | 11.0 | 1.7 | | |
| (3) Net structural shift | +33,266 | − 5,608 | −37,929 | −17,090 | +21,500 |
| Percentage of positive net structural shift | 42.9 | | | | 27.7 |
| Percentage of negative net structural shift | | 7.3 | 48.9 | 22.0 | |

[a] Includes "not stated" industry in net regional shift.

In five of the provinces that had suffered outward shifts in total employment over the decade, both regional and structural shifts were negative. These provinces were Newfoundland, Prince Edward Island, New Brunswick, Manitoba and Saskatchewan. In Newfoundland and Prince Edward Island the structural effects were of some importance – explaining 44 and 42 per cent of the total shift, respectively. In New Brunswick and Manitoba the negative regional effect was by far the dominant factor although it was

reinforced to a limited extent by an unfavourable structural shift. Saskatchewan was the province that suffered most from an unfavourable structure of employment – more specifically, a concentration of employment in agriculture, a declining sector. None the less, as Table 9 shows, agriculture contributed *positively* to the regional effect in Saskatchewan, helping to counterbalance the large negative shifts in some of the service-producing sectors. It is interesting to contrast this situation in Saskatchewan with the developments in Ontario. In both provinces agriculture added to the positive regional shift because, although a declining sector, it declined less rapidly in these two provinces than in the country as a whole. But in Saskatchewan the negative structural effect stemming from concentration of employment in agriculture overwhelmed the small contribution on the regional side while in Ontario the structural effect pulled in the opposite direction, the percentage of total employment in agriculture in Ontario being well below that in Canada.[1]

In the remaining two provinces, Quebec and New Brunswick, the regional conditions for growth were poor but the negative regional effect was partially offset by a favourable balance of rapid-growth industry. This positive structural effect was relatively more important in Quebec than in Nova Scotia. Quebec's experience over this decade contrasts so sharply with that of Ontario that it is worth noting a few examples of these contrary developments. The largest contributions to the negative regional shift in Quebec stemmed from agriculture and community, business and personal service[2] (see Table 9), both of which yielded positive shifts in Ontario. Manufacturing, on the other hand, grew more rapidly in Quebec than in Canada as a whole (although the differential was slight) while the opposite was true in Ontario. And in some other sectors – for example, forestry,

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[1] In 1951, the percentage of total employment in agriculture in Ontario wae 10.7 while in Canada it was 15.6. By 1961, the percentage in Ontario wae 7.1 and in Canada, 9.9. Thue Ontario's structural "advantage" by 1961 was leee than it had been in 1951 (a coneequence of the favourable regional effect). This point illustratee one of the limitatione of thie tool of analyeie – the etructural effect is calculated on the basis of the etructure at the beginning of the period and will change over time. One could, of course, have based all calculatione on 1961, comparing "expected" and "actual" 1951 employment and thue eetimating etructural ehifts in terme of 1961 weighte; there ie no *a priori* reason for chooeing either method. For a comment, eee Dunn, *op. cit.*, p. 108. The changea in the provincial dietribution of rapid- and elow-growth induetries over the 1951-61 decade were not large enough to produce undue dietortion of theee reeulte. However, if the analyeis were extended over a longer period of time, the difference in the eetimation of the structural ehift by baee year or terminal year weights could be eubstantial. Cf. Victor R. Fuchs, "Changes in the Location of U.S. Manufacturing Since 1929", *Journal of Regional Science*, Spring, 1959, pp. 11 and 12. Here an average of the results obtained with each eet of weighta is used.

[2] Both the more-rapid-than-average decline of agriculture and the slower-than-average growth of eervices in Quebec between 1951-1961 affected the structure of Quebec'e industry employment by 1961. The first – the shrinkage of agriculture – would affect it favourably, the latter – the lagging of eervicee – would affect it unfavourably. Thie is another example of the "index number" problem mentioned in footnote[1] above, i.e., by using baee-year weighte, the effect of differential growth on the structure of industry is ignored.

construction and transportation – the growth record in Quebec was better than in Ontario. But this was not sufficient to offset the large "deficits" generated by the greater-than-average decline in agricultural employment and the slow growth of the service sector in Quebec.

Finally, Table 10 summarizes, in percentage terms, the provincial distribution of the two types of shift. Alberta and Ontario together absorbed almost 95 per cent of the total positive *regional* shift in employment; these two stand out as the main "growth" regions. Quebec, Ontario and British Columbia together enjoyed almost 95 per cent of the total positive *structural* shift in employment. Thus, positive (inward) shifts in employment, of either source, were not widespread among the provinces. Negative shifts were not quite so concentrated. The four Atlantic Provinces and Quebec (the entire eastern part of Canada) accounted for about 88 per cent of the total outward regional shift. On the structural side, the three Prairie Provinces shared almost 80 per cent of the negative shift. A fair summary would be that negative regional effects were concentrated in the East and negative structural effects in the Prairies. Ontario and British Columbia escaped both.

## COMPARISON OF PROVINCIAL EMPLOYMENT STRUCTURES

Although, at the high level of aggregation considered in the foregoing analysis, the structural effect was not as important as the regional effect in explaining net shifts in total employment among the provinces over this period, it was dominant in the cases of British Columbia and Saskatchewan and substantial in some other provinces (Newfoundland, Prince Edward Island and Ontario). "Structure" of industrial employment, as used in this context, refers to the mix of slow- and rapid-growth industries, defined as industries that grew in employment less or more than the all-industry rate. In Table 11 some information on this aspect of employment structure is provided. The location coefficient is simply the ratio of the proportion of the labour force in a given industry in a province to the corresponding proportion in Canada. The higher the coefficient, the relatively more important is that industry in the province than in the country. The broad industry groups have been classified according to whether they experienced above- or below-average rates of growth in employment between 1951 and 1961.[1] The location coefficients relate to the base year 1951.

[1] The location coefficient and the two-way classification of industries are rather crude devices for distinguishing those provinces with "growth-rich" or "growth-poor" industry mixes. This is so for two reasons. First, the range of growth rates, above or below the all-industry average, is very large and the two-way division does not take this into account. Secondly, the location coefficient is based on percentages and gives no notion of the absolute size of the industry work force. It can, then, only indicate the *direction* but not the *extent* of the structural shift involved. Finally, as mentioned at the outset, the growth rates of some industries (the cyclically-sensitive) were more strongly affected than others by the choice of the base and terminal dates of the period, and this would distort the findings to some extent.

## Table 11 – Location Coefficients[a] by Province, Fast- and Slow-Growth Industries,[b] 1951

| Industry group (as of 1961) | Newfoundland | Prince Edward Island | Nova Scotia | New Brunswick | Quebec |
|---|---|---|---|---|---|
| **A. Fast-Growth Industries** | | | | | |
| Construction | 0.85 | 0.80 | 1.07 | 0.87 | 1.07 |
| Trade | 0.98 | 0.86 | 1.01 | 0.99 | 0.90 |
| Finance, insurance and real estate | 0.22 | 0.44 | 0.63 | 0.59 | 0.96 |
| Community, business and personal service | 0.77 | 0.91 | 0.99 | 0.98 | 1.07 |
| Public administration and defence | 1.53 | 1.16 | 1.78 | 0.86 | 0.74 |
| Per cent of total labour force in Group A[c] | 39.7 | 38.5 | 47.2 | 40.3 | 42.0 |
| **B. Slow-Growth Industries** | | | | | |
| Agriculture | 0.21 | 2.45 | 0.68 | 1.01 | 0.84 |
| Forestry | 3.96 | 0.32 | 1.08 | 3.80 | 1.24 |
| Fishing | 17.30 | 4.80 | 4.40 | 2.60 | 0.30 |
| Mining | 1.70 | – | 3.50 | 0.35 | 0.70 |
| Manufacturing | 0.53 | 0.36 | 0.64 | 0.70 | 1.19 |
| Transportation, communication and other utilities | 1.28 | 0.80 | 1.14 | 1.28 | 0.93 |
| Per cent of total labour force in Group B[c] | 59.0 | 60.2 | 51.2 | 58.0 | 56.1 |

| | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia |
|---|---|---|---|---|---|
| **A. Fast-Growth Industries** | | | | | |
| Construction | 1.05 | 0.88 | 0.55 | 1.17 | 1.05 |
| Trade | 1.03 | 1.21 | 0.91 | 1.04 | 1.17 |
| Finance, insurance and real estate | 1.22 | 1.11 | 0.59 | 0.81 | 1.22 |
| Community, business and personal service | 0.95 | 0.96 | 0.96 | 0.96 | 1.13 |
| Public administration and defence | 1.07 | 1.05 | 0.63 | 1.11 | 1.23 |
| Per cent of total labour force in Group A[c] | 44.4 | 45.7 | 35.7 | 44.3 | 50.1 |
| **B. Slow-Growth Industries** | | | | | |
| Agriculture | 0.69 | 1.58 | 3.13 | 2.08 | 0.40 |
| Forestry | 0.48 | 0.20 | 0.08 | 0.16 | 2.24 |
| Fishing | 0.10 | 0.50 | 0.50 | 0.30 | 1.10 |
| Mining | 0.80 | 0.65 | 0.30 | 2.20 | 1.30 |
| Manufacturing | 1.30 | 0.61 | 0.17 | 0.33 | 0.89 |
| Transportation, communication and other utilities | 0.95 | 1.22 | 1.00 | 0.98 | 1.15 |
| Per cent of total labour force in Group B[c] | 54.6 | 53.5 | 63.7 | 55.0 | 48.4 |

[a] Ratio of the percentage of the labour force in a given industry in a province to the corresponding percentage of the same industry in Canada, expressed as an index. [b] Fast-growth or slow-growth industries were those which enjoyed a rate of increase of employment, between 1951 and 1961, above (below) the all-Canada increase. [c] Does not add to 100 per cent because of omission of "Not Stated Industries".

A "growth-rich" structure of employment in a given province would require mostly high coefficients (above 1.00) in Group A and low coefficients (below 1.00) in Group B. A "growth-poor" structure would involve the opposite.[1] It may be seen that Ontario and British Columbia are better off than most of the other provinces in their industry mix, followed by Quebec. Particularly unfavourable (to growth) structures are found in the Atlantic region, i.e, generally low coefficients in Group A and a number of very high coefficients in Group B. In Nova Scotia the high coefficients in the slow-growth sectors are offset by a better mix of high-growth industries and, as already noted, Nova Scotia was the only Atlantic province to have enjoyed a positive structural shift in employment between 1951 and 1961. In the Prairie region, again, the mix is rather poor, especially in Saskatchewan where the location coefficients are uniformly low in Group A and the dominance of agriculture stands out in Group B. In Manitoba and Saskatchewan the picture is not so dark; a few high coefficients in Group A tend to balance, to some extent, the concentration of agriculture in Manitoba and agriculture and mining in Alberta. These differences in mix are reflected in the differences, discussed above, in the strength of the structural effect among these three provinces.

## SHIFTS WITHIN THE MANUFACTURING SECTOR: ONTARIO AND QUEBEC

As was stressed at the outset of the discussion on regional versus structural shifts in employment among the provinces, the relative dimensions of these two types of shift are affected by the level of aggregation of the industry data. In other words, by using a broad classification, dividing total employment into only 11 major sectors, one estimate of these two shifts was derived. If, say, 25 or 250 industrial divisions had been used, the relative size of the two effects would have been different. More specifically, some structural effects *within* the broad sectors are hidden when only 11 divisions are considered and are allocated to the regional shift estimate. This is probably more important in some sectors – for example, manufacturing and mining which cover a range of diverse activity – than in others. The following analysis of some of the finer industry divisions within manufacturing in Quebec and Ontario illustrates this fact and also provides further insight into the employment changes that took place over the 1951-61 decade in these two large contiguous provinces.

Table 12A presents the regional shifts for each of the 17 major subgroups in manufacturing in Quebec and Ontario. In Table 12B the net shift

[1] No weights are attached to these coefficients and hence one cannot estimate from Table 7 to what extent, in terms of actual numbers, the coefficients in Groups A and B will offset each other. *Cf.* comments in footnote[1], p. 31.

in total manufacturing employment is allocated to the regional and structural components, the former being the (algebraic) sum of the shifts for the subgroups. It may be seen that the total shift for the entire manufacturing sector, which at the level of aggregation of the preceding analysis was estimated as a regional shift, in fact includes a not inconsiderable structural effect in both provinces. In Quebec, indeed, the unfavourable structural effect all but wiped out the positive regional influence which, as Table 12A shows, stimulated above-average employment increases in a majority of the manufacturing industry divisions in that province.

**Table 12A – Net Total Employment Shifts, Industry Groups, Manufacturing Sector: Canada, Quebec and Ontario, 1951-61**

| Industry Group (as of 1961) | Canada | Quebec | Ontario |
|---|---|---|---|
| Food and beverage industries | ± 4,172 | + 1,894 | – 36 |
| Tobacco products industries | ± 668 | – 528 | + 642 |
| Rubber industries | ± 413 | – 20 | – 393 |
| Leather industries | ± 728 | + 191 | + 507 |
| Textile products industries | ± 1,219 | + 706 | + 77 |
| Knitting mills | ± 2,041 | + 1,387 | – 2,022 |
| Clothing industries | ± 3,336 | + 2,934 | – 2,411 |
| Wood industries | ± 7,735 | – 2,748 | – 768 |
| Furniture and fixtures industries | ± 1,622 | + 1,125 | – 1,133 |
| Paper and allied industries | ± 3,857 | – 1,593 | – 294 |
| Printing, publishing and allied industries | ± 1,052 | – 135 | – 358 |
| Primary metal fabricating and electrical products industries | ± 9,128 | + 4,780 | – 7,505 |
| Transportation equipment industries | ± 4,132 | + 3,619 | – 1,270 |
| Non-metallic mineral products industries | ± 1,922 | + 137 | – 1,486 |
| Petroleum and coal products industries | ± 1,004 | + 213 | – 448 |
| Chemical and chemical products industries | ± 3,888 | – 3,429 | + 1,829 |
| Miscellaneous manufacturing industries | ± 1,030 | – 572 | + 682 |

**Table 12B – Allocation of Net Total Employment Shift, Manufacturing: Canada, Quebec, Ontario, Regional and Structural Effects, 1951-61**

| Shift | Canada | Quebec | Ontario |
|---|---|---|---|
| (1) Net total employment shift | ± 18,465 | + 821 | – 7,543 |
| (2) Net regional shift | ± 26,238 | + 7,961 | – 14,387 |
| (3) Net structural shift | ± 12,071 | – 7,140 | + 6,844 |

In Ontario, the structural shift – in the opposite direction – was less significant but still acted to reduce by almost one-half the strong outward shift arising from regional influences in the province. The experience of

the two provinces contrasts sharply in a number of industries but perhaps most strikingly in the large primary metal, metal fabricating and electrical products division in which Quebec enjoyed a net inward shift of employment of almost 5,000 workers and Ontario suffered an outward shift of 7,500.

It is not appropriate here to explore in any detail the structural differences in manufacturing activity between the two provinces. Quebec has a relatively larger labour force in the slow-growth primary and secondary textile industries, in leather and wood products. Excluding the primary metal, metal and electrical products group from both categories (since the percentage increase in employment in that industry division between 1951 and 1961 exactly matched the all-industry average) in Quebec almost 50 per cent of the manufacturing labour force was attached to slow-growth industries in 1951 whereas the corresponding proportion in Ontario was just over 32 per cent. On the other hand, Quebec's share of rapid-growth manufacturing was slightly *higher* than Ontario's; 36.1 per cent of the manufacturing labour force in Quebec in 1951 was in fast-growing industries compared with 35.8 per cent in Ontario.[1] Thus, it would appear that Quebec's unfavourable structure in manufacturing arose not from a "deficiency" of rapid-growth industries over the period 1951-61 but from a "surplus"—vis-à-vis Ontario—of lagging industries.

## SUMMARY OF SHIFT ANALYSIS

The foregoing portion of this Study has focused attention on *shifts* in employment among the ten provinces of Canada over the past intercensal decade. In doing so, one inevitably receives an impression of change and movement. Such an impression may be misleading unless the shift analysis is placed in perspective. It should be remembered that the Lorenz curves indicated that there were only small changes in the distribution of the economically active population or total employment among the provinces between 1951 and 1961. There were some changes, in the direction of greater equality, in the provincial distribution of most of the broad occupational and industrial components of the labour force and also some small degree of convergence of provincial occupational and industrial structures toward the national average.

[1] The exclusion of the metal-electrical products group accounts for this surprising contrast since this group of industries forms the largest division of Ontario manufacturing, accounting for almost 32 per cent of the total manufacturing labour force. A marked slow-down in the rate of growth of this industry *nationally* would have a serious effect on employment growth in Ontario. As was noted above, a lagging growth of the Ontario part of the industry contributed substantially to the negative regional shift in that province's manufacturing employment over the 1951-61 period. These industries are cyclically sensitive and perhaps unduly affected by the high level of unemployment prevailing at the time of the 1961 Census. This, as noted several times in prior discussion, may well have distorted some of the findings of this period.

It should be remembered further that the shift analysis is based on comparing *relative* change among provinces against a national standard. A comparison of *absolute* changes would yield a somewhat different picture because of the wide variation in the employment base from province to province. This is not to imply that the shifts in employment were not of significance. True, at the national level, the total net shift in employment was only 16 per cent of the absolute increase over the period indicating a degree of stability in the over-all distribution of industrial activity among the provinces. However, in the Atlantic Provinces the net shift was many times as large as the actual change and it was also very substantial in the Prairies. Only in Quebec and Ontario did the shift constitute a relatively small proportion of the employment increase. It might also be noted here, though it was not brought out in the earlier discussion, that shifts in employment were much more important in some industries than in others. Thus, while in the service-producing sectors the employment shifts were negligible, amounting to less than 10 per cent of actual employment change, in manufacturing the net employment shift formed almost 30 per cent of the actual increase and in mining—the most extreme case—the shift more than matched in size the absolute change in employment over the period. Again, this result may be partly due to the cyclical effects referred to earlier, which would be more important in the manufacturing than the service sectors, with consequent differences in provincial impact as well. None the less, for some provinces and some industries, employment shifts were of considerable importance in explaining differential changes in economic activity over the decade.

Placed in its proper perspective, the merit of the shift analysis as an expository tool is that it reveals the proximate source of the differential employment experience of the various geographic units, in this case provinces, over a chosen period. This it does by separating out differential change due to *regional* effects, i.e., conditions within the *province* which encourage or retard the growth of employment in specified sectors of activity and to *structural* effects, i.e., conditions within the *nation* (or beyond national borders) which shape the relative growth of different sectors. One merit of the analysis is that it reveals the extent to which so-called "regional problems" stem from national or even international economic conditions.

A final example of the usefulness of the tool may be observed in Table 13 which illustrates the six possible combinations of regional and structural shifts in terms of the experience of the Canadian provinces over the past intercensal decade. A few points are worth noting. The "gainers' club" is again seen to be more exclusive than that of the "losers"; only three of Canada's ten provinces were favoured, over the 1951-61 decade,

by net inward shifts in total employment. Further, only two – Ontario and British Columbia – were blessed by advantages both regional (environmental) and structural. Most of the "losers" were doubly disadvantaged, suffering both from adverse environmental and structural conditions. For Quebec, and to a lesser extent Nova Scotia, favourable structural effects helped somewhat to offset the negative regional climate prevailing over this decade.

**Table 13 – Summary of Employment Experience, Ten Provinces, 1951 - 1961**

| Inward net shift in total employment | | | Outward net shift in total employment | | |
|---|---|---|---|---|---|
| + Regional + Structural | + Regional – Structural (+ dominant) | – Regional + Structural (+ dominant) | – Regional – Structural | + Regional – Structural (– dominant) | – Regional + Structural (– dominant) |
| (1) | (2) | (3) | (4) | (5) | (6) |
| Ontario<br>British Columbia | Alberta | | Newfoundland<br>Prince Edward Island<br>New Brunswick<br>Manitoba<br>Saskatchewan | | Nova Scotia<br>Quebec |

# 4. Conclusions

In part by reason of design, in larger part by reason of severe data deficiencies, the main thrust of the foregoing Study has been descriptive and expository. The trends in the geographic composition of the Canadian labour force and its components thus revealed are perhaps less dramatic than were other aspects of structural change in the working population – changes in the nature of work performed, the marked rise in female participation, the impact of immigration, etc., as described in other Studies in this series. While there is evidence, presented in a variety of measures, of some degree of convergence in the manpower "structure" of the Canadian provinces over the past half-century, there is also ample evidence of strong eddies and currents, running counter to the main stream of development, at different times and in different regions. The underlying causes of these changes in the provincial deployment of the Canadian labour force are far less likely to be found in further analysis of population and labour force – for the demand for labour is a derived demand – than in the history of economic activity itself in this country. This is, of course, the task of the economic historian. But economic historians have tended to concentrate on changes in products and processes, dealing rather summarily with the manpower consequences of these changes. It is to be hoped that this and similar labour force studies will contribute to redressing the balance.

## APPENDIX

The calculation of the shifts of employment by province involved the following:

$E^t_{ip}$ employment in the $i-th$ industry and the $p-th$ province at the beginning of the time period

$E^{t+1}_{ip}$ employment in $i-th$ industry and the $p-th$ province at the end of the period

$E^t_{ic}$ employment in $i-th$ industry in Canada at the beginning of the period $= \Sigma_p E_{ip}$

$E^{t+1}_{ic}$ same,. at the end of the period

$E_p$ total provincial employment $= \Sigma_i E_{ip}$

$E_c$ total Canadian employment $= \Sigma_{i,p} E_{ip}$

The total net employment shift for a province is:

(1) $S_t = E^{t+1}_p - (E^{t+1}_c / E^t_c) E^t_p$

The net regional shift for a province is:

(2) $S_r = \Sigma_i \left[ E^{t+1}_{ip} - (E^{t+1}_{ic} / E^t_{ic}) E^t_{ip} \right]$

and the net structural shift is:

(3) $S_t - S_r = E^{t+1}_p - (E^{t+1}_c / E^t_c) E^t_p - \Sigma_i \left[ E^{t+1}_{ip} - (E^{t+1}_{ic} / E^t_{ic}) E^t_{ip} \right]$

$= \Sigma_i (E^{t+1}_{ic} / E^t_{ic}) E^t_{ip} - (E^{t+1}_c / E^t_c) \Sigma_i E^t_{ip}$

$= \Sigma_i \left[ (E^{t+1}_{ic} / E^t_{ic}) - (E^{t+1}_c / E^t_c) \right] E^t_{ip}$

which is the sum of the (weighted) differences between all-Canada growth rates by industry and the all-Canada, all-industry, growth rates, where the weights are the total industry employment in the province in the initial year.

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